

## ABSTRACT OF THE INVENTION

5 A substantially pure and isolated DNA fragment having a nucleic acid sequence as shown in SEQ ID NO. 1 or SEQ ID NO. 2, and a substantially pure peptide having an amino acid sequence selected from the group consisting of SEQ ID NO. 3, SLS, SEQ ID NO. 4, SQD, SLL and SEQ ID NO. 5 are provided. Also provided are vaccines, antibodies and pharmaceutical compositions generated from at least one of the DNA fragments and/or peptides. Further provided are methods for detecting and/or treating rheumatoid arthritis.